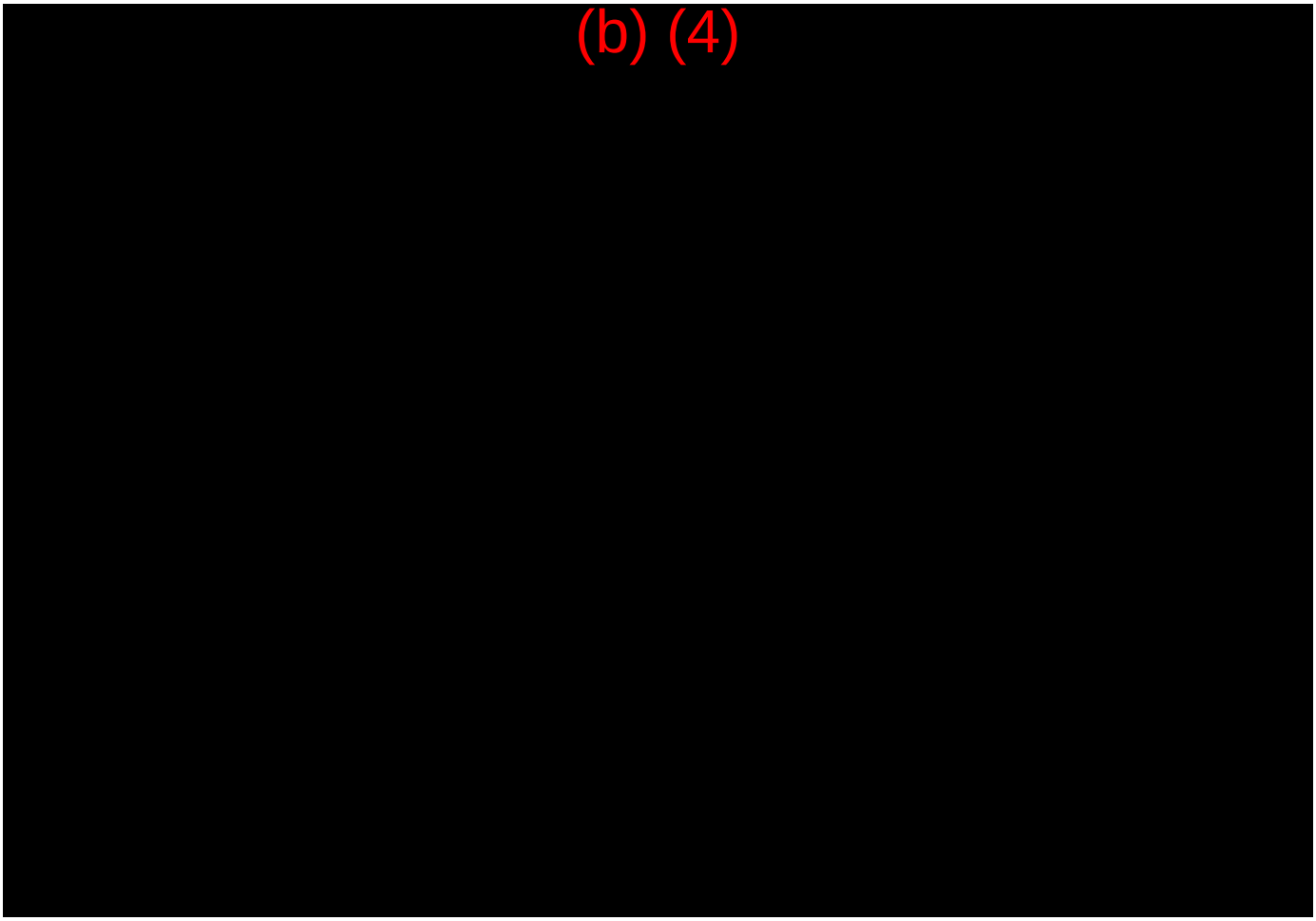
1131 Questions from EPA 23rd March 2020 Concerning the Vitrification unit.

Answer are provided by Technotherm, Inc., the Manufacturer of the equipment.

General description: -



The furnace initially uses natural gas or similar fuel to commence the process. Once we have residue and tars removed by way of the gas clean up process, these are consumed and thus create the heat input to the pyrolysis system, thus eliminating any external energy input and remaining self-sustaining.

1) **What happens to the tar when it enters the vitrifier**?

The tar is admitted by way of a duel fuel burner to efficiently process the tar and creates the energy required for the process by heating the outer surface of the pyrolysis retort. Thermal energy from tar processing does not enter the Pyrolysis Rotary Retort, rather it heats the external surface of the rotary retort thereby indirectly providing heat to the waste being processed.

2) **Why is this unit called a vitrifier? Could you explain in detail how this process operates, its purpose, and any by-products it makes and what is done with any by-products?**

For your application it should not be labled as a vitrifier – rather a pyrolysis heating furnace. The unit consumes any energy in the tar and residue and uses this to provide the energy input to the process

(as stated in (1) above). The exiting products of combustion are the same or similar to that that would be exhausted from any clean combusting system. The exhaust characteristics have been previously advised, that initially report to the regenerative thermal oxidizer for pollution control.

As a consequence to admission of the residue into the vitrification unit the discharged product is totally inert and can be sent to inert landfill, used as road fill or mixed with cement. Once classified when the plant is commissioned approval may be sought to provide as a soil enhancement.

3**) How integral is the vitrifier to the pyrolysis unit in terms of the overall process?**

As explained above the vitrifier (Pyrolysis heating chamber) is an integral part of the pyrolizer. This is essential to the pyrolysis unit as it provides the heat externally to the pyrolysis reactor so that the endothermic, oxygen free pyrolysis can occur inside the reactor.

4) Are there any traditional fuels combusted in the vitrifier?

On start up Natural gas or LPG whatever is provided is used. Once the plant is commissioned syngas produced by the pyrolizer is employed for any black starts. During operation the tars and residue will provide the energy input.

To ensure efficient combustion it may be seen that 4 gas burners and 4 oil burners are installed. The gas burners will be used for the syngas or Natural gas, and the oil burners for the tar and oil derived from the gas clean up system.